WHAT IS CLAIMED IS:

1. A bar-code reader that acquires a signal strength of a reflected light that is reflected from black bars and white bars that form a bar code, extracts edge data that changes the signal strength from a black bar to a white bar and vice versa, ternarizes the edge data that is extracted, and decodes bar-code characters by using a result of the ternarizing, comprising:

an amplitude acquiring unit that acquires an amplitude of each module point of the edge data based on a module frequency of the edge data; and

a ternarizing processor that ternarizes the amplitude of the module point by a maximum likelihood method by using amplitudes of a module point and a plurality of module points that are in continuation with the module point.

2. The bar-code reader according to claim 1, wherein the ternarizing processor assigns a state 1, a state 0, and a state -1 that have predetermined reference values respectively, to a plurality of module points in continuity, assigns a least squared error to the amplitude of a module that is to be linked to a path that connects each module point, as a path metric, and ternarizes a state of a module point that is at the origin of a path linkage of a survival path, taking a path for which a sum of path metrics that have gone through a predetermined path becomes minimum as a survival path.

3. The bar-code reader according to claim 2, wherein the ternarizing processor inhibits a path from the state 1 to the state 1 and a path from the state -1 to the state -1.

4. The bar-code reader according to claim 2, wherein the ternarizing processor inhibits a path from the state 1 to the state 1 via a desired number of the states 0, and a path from the state -1 to the state -1 via a desired number of the states 0.

5. The bar-code reader according to claim 2, wherein the ternarizing processor leaves a path from the state 0 to the state 0, when there is a path from the state 1 or the state -1 to the state 0.

6. The bar-code reader according to claim 2, wherein, when there is any one of a thick black bar and a thick white bar, the ternarizing processor changes the reference of any one of the state 1 and the state -1 according to a thickness of any one of a thick black bar and a thick white bar.

7. A method of reading a bar code in which a signal strength of a reflected light that is reflected from black bars and white bars that form a bar code is acquired, edge data that changes the signal strength from a black bar to a white bar and vice versa, is extracted, the edge data that is extracted is ternarized, and bar-code characters are decoded by using a result of the ternarizing, comprising:

acquiring an amplitude of each module point of the edge data based on a module frequency of the edge data; and

ternarizing the amplitude of the module point by a maximum likelihood method by using amplitudes of a module point and a plurality of module points that are in continuation with the module point.

8. The method of reading a bar code according to claim 7, wherein at the ternarizing, a state 1, a state 0, and a state -1 that have predetermined reference values respectively, are assigned to a plurality of module points in continuity, a least squared error is assigned to the amplitude of a module that is to be linked to a path that connects each module point, as a path metric, and a state of module point that is at the origin of a path linkage of a survival path is ternarized, taking a path for which a sum of path metrics that have undergone through predetermined path becomes the least as a survival path.

9. The method of reading a bar code according to claim 8, wherein a path from the state 1 to the state 1 and a path from the state -1 to the state -1 are inhibited at the ternarizing.

10. The method of reading a bar code according to claim 8, wherein a path from the state 1 to the state 1 via a desired number of the states 0, and a path from the state -1 to the state -1 via a desired number of the states 0 are inhibited at the ternarizing.

11. The method of reading a bar code according to claim 8, wherein when there is a path from any one of the state 1 and the state -1 to the state 0, a path from the state 0 to the state 0 is left at the ternarizing.

12. The method of reading a bar code according to claim 8, wherein when there is any one of a thick black bar and a thick white bar, the reference of any one of the state 1 and the state -1 is changed according to a thickness of any one of a thick black bar and a thick white bar at the ternarizing.

13. A bar-code reading computer program that includes a plurality of computer readable instructions that control a bar-code reader that acquires a signal strength of a reflected light that is reflected from black bars and white bars that form a bar code, extracts edge data that changes the signal strength from a black bar to a white bar and vice versa, ternarizes the edge data that is extracted, and decodes bar-code characters by using a result of the ternarizing, wherein the instructions, when executed by the computer, cause the computer to perform:

acquiring an amplitude of each module point of the edge data based on a module frequency of the edge data; and

ternarizing the amplitude of the module point by a maximum likelihood method by using amplitudes of a module point and a plurality of module points that are in continuation with the module point.

14. The bar-code reading computer program according to claim 13,

wherein at the ternarizing, a state 1, a state 0, and a state -1 that have predetermined reference values respectively, are assigned to a plurality of module points in continuity, a least squared error is assigned to the amplitude of a module that is to be linked to a path that connects each module point, as a path metric, and a state of module point that is at the origin of a path linkage of a survival path is ternarized, taking a path for which a sum of path metrics that have gone through predetermined path becomes the least as a survival path.

15. The bar-code reading computer program according to claim 14, wherein a path from the state 1 to the state 1 and a path from the state -1 to the state -1 are inhibited at the ternarizing.

16. The bar-code reading computer program according to claim 14, wherein a path from the state 1 to the state 1 via a desired number of the states 0, and a path from the state -1 to the state -1 via a desired number of the states 0 are inhibited at the ternarizing.

17. The bar-code reading computer program according to claim 14, wherein when there is a path from any one of the state 1 and the state -1 to the state 0, a path from the state 0 to the state 0 is left at the ternarizing.

18. The bar-code reading computer program according to claim 14, wherein when there is any one of a thick black bar and a thick white bar,

the reference of any one of the state 1 and the state -1 is changed according to a thickness of any one of a thick black bar and a thick white bar at the ternarizing.